

REMARKS

Claims 1-60 are at issue in the present application. Claim 35 has been amended and Claim 36 has been cancelled. Reconsideration of the pending claims and allowance is respectfully requested in view of the following comments.

Allowed Claims

Applicant thanks the Examiner for the indication of allowance of Claims 26-34.

Objected to Claims

Claims 6-18, 25, 36, 37, 44, 45, 50-52 and 55-57 are objected to for being dependent upon a rejected base claim. Applicant is appreciative of the indication of allowability with regard to these Claims, however, Claim 9 is an independent claim. Accordingly Claim 9 is allowable in its present form. Applicant respectfully requests indication that independent Claim 9 and corresponding dependent Claims 10-18 are allowed. Applicant also respectfully requests clarification on the status of Claim 48. In the Office Action Summary, Claim 48 is indicated as rejected. In page 4 of the Detailed Action, Claim 48 is indicated as objected to.

Pending Claims

In the Office Action, Claims 1-57 are indicated as pending. As confirmed by attached Exhibit A, which is a copy of the filing receipt of the present application, Claims 1-60 were present in the as-filed application. Applicant respectfully requests examination on the merits of Claims 58-60 in a non-final Office Action.

The 35 U.S.C. 102(b) Claim Rejections

Claims 1-5, 19-24, 35, 38-43, 46-49 and 53-54 stand rejected pursuant to 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,383,109 to Maksimovic et al. (hereinafter "Maksimovic"). Applicant respectfully traverses these rejections for at least the following reasons.

Claims 1-5

Claim 1 provides a power factor correcting power supply. The power factor correcting power supply includes an opposed current converter having an input and an output, a power factor correction controller coupled with the opposed current converter and an output stage power converter coupled with the output of the opposed current converter. The opposed current converter is directed by the power factor correction controller to control the waveshape of an AC line current supplyable to the input by a power source. The output stage power converter is configured to provide isolation and voltage conversion of a DC boost voltage provided at the output of the opposed current converter.

In contrast, Figure 11 of Maksimovic teaches a full bridge rectifier (diodes 23-26) and a pair of inductors (81, 82) coupled through respective switches (93, 94) and diodes (95, 96) to an output circuit 40. (Fig. 11) In the office action, it has been asserted that the combination of the inductors, switches and diodes is equivalent to the opposed current converter provided in Claim 1. Applicant respectfully traverses this assertion since the inductors, switches and diodes of Maksimovic are not controllable by a power factor correction controller in stark contrast to the opposed current converter described in Claim 1. In addition, the inductors, switches and diodes of Maksimovic do not regulate the magnitude of a DC boost voltage as also described in Claim 1. Further, the inductors, switches and diodes of Maksimovic do not control the waveshape of an AC input current as is also described in Claim 1.

As taught by Maksimovic, the switches are in a first position (L) during low line voltage conditions and a second position (H) during high line voltage conditions. (Col. 8 lines 13-18) The inductors are energy storage devices. During operation, energy stored in the inductors is transferred to capacitors included in the output circuit of Maksimovic. (Col. 4 lines 53-57) Although not discussed by Maksimovic, it is probable that the switches of Maksimovic are controlled by some form of voltage sensing device, and are toggled based on the magnitude of line voltage. Clearly, the inductors, switches and diodes of Maksimovic are not directed by a power factor correction controller to control the waveshape of an AC line current as described in Claim 1. It follows that the inductors, switches and diodes of Maksimovic cannot be controlled with a power factor correction controller to regulate DC

boost voltage as provided in Claim 3, nor are they directed with frequency modulation to control electromagnetic interference as described in Claim 4.

However, Maksimovic does teach that the output circuit provides output voltage regulation and power factor control by switching transistors in the output circuit (40) at high frequency to control the waveshape of the current drawn from an AC line, and also to control the voltage across a capacitor(s) included in the output circuit. (Col. 4 lines 48-59) In the office action, however, it was asserted that the output circuit of Maksimovic was equivalent to an output stage power converter as described in Claim 1. In contrast to Maksimovic, the output stage power converter described in Claim 1 is configured to provide isolation and voltage conversion of a DC boost voltage provided at the output of an opposed current converter. Since Maksimovic does not teach or suggest an opposed current converter, as previously discussed, the output circuit of Maksimovic cannot possibly be provided a DC boost voltage from an opposed current converter as described in Claim 1.

In the office action, it was further asserted that the diodes 45 and 46 included in the output circuit of Maksimovic provide isolation as described in Claim 1 of the present application. As is well known in the art, diodes allow for relatively large current flows when forward biased, and allow for relatively small current flows when reverse-biased. Isolation is defined as "the action of isolating" and isolating is defined as "to set apart from others." Webster's Ninth New College Dictionary, 1999. Clearly the diodes of Maksimovic do not isolate the output circuit since large currents can flow through the diodes of Maksimovic when the diodes are forward biased.

For at least the foregoing reasons, Maksimovic fails to expressly or inherently describe each and every element of Claims 1, 4 and 5. Accordingly, Claims 1, 4 and 5 are patentably distinct over Maksimovic. Dependent Claims 2-5 depend from independent Claim 1 and are therefore also patentably distinct. Thus, Applicant respectfully requests removal of the 35 U.S.C. §102(b) rejection of Claims 1-5.

Claims 19-24

Claim 19 describes a power factor correcting power supply that includes an opposed current converter configured to receive an AC input voltage and an AC input current and supply a DC boost voltage. The opposed current converter includes a first boost switch and a

second boost switch having a duty cycle. The first and second boost switches are closeable concurrently during the duty cycle. The power factor correcting power supply also includes means for controlling power factor coupled with the opposed current converter, where the means for controlling power factor is configured to control the duty cycle of the first and second boost switches to adjust a waveform of the AC input current to improve power factor.

In the office action, it is apparently being asserted that the inductors, switches and diodes of Maksimovic are equivalent to the power factor correcting power supply described in Claim 19. As previously discussed, Applicant respectfully asserts that no such equivalency exists. Specifically, the switches of Maksimovic are toggled from a low voltage position to a high voltage position in response to an AC line voltage. Accordingly, Maksimovic does not teach or disclose means for controlling power factor that is configured to control a duty cycle of a first and second boost switches to adjust a waveform of the AC input current to improve power factor as described in Claim 19.

However, Maksimovic does teach an output circuit that can control the waveshape of current drawn from a line as previously discussed, but conversely fails to teach that the output circuit is configured to receive an AC input voltage and an AC input current and supply a DC boost voltage as described in Claim 19. In addition, Maksimovic does not include means for converting the DC boost voltage to a desired output voltage as described in Claim 20, nor does Maksimovic teach a means for controlling power factor that is configured to regulate the desired DC output voltage as a function of the DC boost voltage as described in Claim 21. Further, a means for controlling power factor that is configured to regulate the desired DC output voltage as a function of the DC boost voltage and the desired DC output voltage as described in Claim 22 is not taught or disclosed by Maksimovic. Maksimovic also fails to teach or disclose regulation of the desired DC output voltage as a function of the DC boost voltage, the desired DC output voltage and the AC input current as described in Claim 23. A means for converting the DC boost voltage that is configured to galvanically isolate the desired DC output voltage from an opposed current converter as described in Claim 24 is also not taught or disclosed in Maksimovic.

Accordingly, for at least the foregoing reasons, Claims 19-24 include elements that are not expressly or inherently described by Maksimovic and are therefore patentably distinct in

view of Maksimovic. Dependent Claims 20-24 also depend from independent Claim 19 and are therefore also patentably distinct for this reason. Accordingly, Applicant respectfully requests removal of the 35 U.S.C. §102(b) rejection of Claims 19-24.

Claims 35 and 38-43

Claim 35 has been amended to include the subject matter of Claim 36 and Claim 36 has been cancelled. Claim 36 was objected to as being dependent on a rejected base claim. Accordingly, Claim 35 is now allowable and Applicant respectfully requests removal of the 35 U.S.C. §102(b) rejection of Claims 35 and 38-43.

Claims 46-49

Claim 46 describes a method of performing power factor correction with a power factor correcting power supply. The method includes providing an AC power source having an AC input voltage and an AC input current and converting the AC input voltage to a first DC voltage with an opposed current converter controlled by a power factor correction controller. The method also includes transforming the first DC voltage to a second DC voltage with an output stage power converter and supplying the second DC voltage to a power rail to supply a load.

Conversely, Maksimovic does not teach or disclose converting the AC input voltage to a first DC voltage with an opposed current converter controlled by a power factor correction controller as described in Claim 46. The inductors, switches and diodes of Maksimovic are not being controlled by a power factor correction controller, but instead may be controlled by some form of voltage sensing device as previously discussed. The output circuit of Maksimovic, does include power factor correction, but does not, however, include the function of converting an AC input voltage to a first DC voltage. Even if one was to somehow construe the output circuit of Maksimovic as being equivalent to the opposed current converter of Claim 46, which is clearly not the case, then Maksimovic still does not teach or suggest transforming a first DC voltage to a second DC voltage with an output stage power converter as also described in Claim 46.

Thus, for at least the foregoing reasons, Claim 46 is patentably distinct since Maksimovic does not expressly or inherently describe each and every element of Claim 46. In addition, dependent Claims 47-49 depend from independent Claim 46 and are therefore also patentably distinct. Accordingly, Applicant respectfully requests removal of the 35 U.S.C. §102(b) rejection of Claims 46-49.

Claims 53, 54 and 58-60

Claim 53 describes a method of performing power factor correction with a power factor correcting power supply. The method includes providing an AC power source having an AC input voltage and an AC input current and converting the AC input voltage to a DC voltage with an opposed current converter controlled by a power factor correction controller. In addition, the method includes decreasing a magnitude of a pulse width modulation voltage created by the opposed current converter from the AC input voltage to increase the flow of AC input current into the opposed current converter and increasing the magnitude of the pulse width modulation voltage to decrease the flow of AC input current into the opposed current converter.

Conversely, Maksimovic teaches a full wave rectifier to convert an AC input voltage to a DC voltage. Clearly, the full wave rectifier of Maksimovic is not controlled with a power factor correction controller. In fact, the full wave rectifier of Maksimovic is not controlled at all. Maksimovic also fails to teach or disclose increasing and decreasing a magnitude of pulse width modulation voltage as further described in Claim 53.

For at least the foregoing reasons, Maksimovic fails to expressly or inherently describe each and every element of Claim 53. Accordingly, Claim 53 is patentably distinct over Maksimovic. Dependent Claim 54 depends from independent Claim 53 and therefore is also patentably distinct. Thus, Applicant respectfully requests removal of the 35 U.S.C. §102(b) rejection of Claims 53 and 54.

Related Non-prior Art Patent and Application

In an abundance of caution, Applicant is hereby disclosing the existence of co-pending U.S. Patent Application Serial No. 10/626,149, filed on July 24, 2003. The present application was filed the same day as U.S. Patent Application Serial No. 10/626,149.

Serial No. 10/626,433
Response to Office Action Mailed October 27, 2004

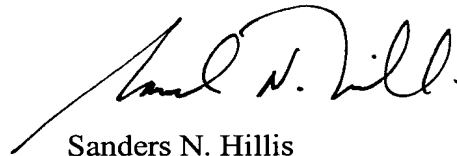
Filing Date: July 24, 2003

Accordingly, U.S. Patent Application Serial No. 10/626,149 is not prior art to the present application.

Conclusion

Maksimovic does not teach or disclose each and every limitation described in presently pending Claims 1-60. Accordingly, all of Claims 1-60 are allowable in their present form and the application is believed to now be in condition for allowance, which is respectfully requested. Should the Examiner deem a telephone conference to be beneficial in expediting examination/allowance of this application, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Sanders N. Hillis", written over a horizontal line.

Sanders N. Hillis
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SNH/dlh

Attached: Exhibit A (Filing Receipt - two (2) pages)

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